

In the Specification:

Replace the paragraph beginning on page 2, line 17 with the following amended paragraph:

The key used in the disclosed knife assembly is especially thin and thus liable to break. In addition, the key is difficult to position correctly and when fitting the reversible knife the clamp too must be removed. This is because the grooves in the counter knife only cover part of the width of the reversible knife. At the same time, several keys are required for a single reversible knife, making it even more difficult to set the reversible knife. In practice, the counter knife too wears during chipping. However, the disclosed knife assembly uses one and the same counter knife for a long time. In addition, the changing of the counter knife is labourious, as it is attached with screws. Further, the load arising in operation tends to lift the reversible knife and the counter knife. Sawdust then becomes packed between them, bending the ~~knives~~ knives and reducing the conducting of heat away from the ~~knives~~ knives. In addition, a most of the load acting on the reversible knife and the counter knife is directed onto the screws that act as the securing means.

Replace the paragraphs beginning on page 3, line 1 (see Preliminary Amendment) with the following amended paragraphs:

The invention ~~[[is]]~~ provides a new type of knife assembly for a chipper, which is easier to use than before, but which has a longer life and is thus more economical.

Accordingly, a knife assembly for a chipper, which is intended to be installed in the knife frame forming part of the chipper, and which knife assembly includes

- a counter knife fitted to the knife frame,
- an essentially symmetrical reversible knife set against the counter knife, at the opposite sides of which there are two cutting bevel edges one of which cutting bevel edges extends further than the counter knife from the knife frame,

- a clamp, which is arranged to press on the reversible knife from the opposite side than the counter knife,
- securing means for securing the clamp and tightening it onto the knife frame and thus for pressing the reversible knife between the clamp and the counter knife, and
- at least one locking piece, which runs parallel to the longitudinal axis of the reversible knife and which extends on both sides of the boundary surface between the reversible knife and the counter knife, in order to prevent lateral movement of the reversible knife relative to the counter knife, and which locking piece is arranged to form a fixed part of the reversible knife or the counter knife,

in which knife assembly the reversible knife, the counter knife, and the locking piece are arranged in such a way that the position of the reversible knife relative to the knife frame can be set as desired in the lateral direction of the reversible knife, is characterized in that the counter knife has two counter-surfaces arranged to rest on the knife frame, which are arranged to form an acute angle α , the size of which is 25 - 75°, preferably 35 - 70°, for fitting the counter knife to the knife frame using shape-locking.

The clamp may have two counter-surfaces arranged to rest on the knife frame, which are arranged to form an acute angle β , the size of which is 40 - 85°, preferably 45 - 75°. And the angle between the bisectors of angles α and β is a maximum of 20°.

The locking piece may be arranged in the counter knife, a groove corresponding to it being arranged in the reversible knife while the width of the locking piece in the lateral direction of the reversible knife is greater than the height of the locking piece.

The counter knife and the clamp may be arranged to be supported directly on the knife frame.

A counter-knife series for a knife assembly in which knife assembly both cutting bevel edges of the reversible knife are arranged so that they can be sharpened, is characterized in that for each sharpened reversible knife the counter-knife series includes a corresponding counter knife, in order to adapt the position of the sharpened cutting bevel edge relative to the knife frame, to be the same as it was prior to sharpening. The counter-knife series may include 1 - 6, preferably 2 - 5 different counter ~~knives~~ knives for changing the position of the reversible knife by 0.5 - 1.5 mm, preferably 0.8 - 1.2 mm in the lateral direction of the reversible knife, after sharpening.

The counter-knife series may include at least one second counter-knife series including a corresponding number of counter ~~knives~~ knives, in which the angle γ of the counter bevel edge of the counter ~~knives~~ knives and/or the distance of the cutting bevel edge from the counter bevel edge are different to those in the first counter-knife series.

The counter ~~knives~~ knives may be precipitation-hardened cast pieces or rolled pieces.

In the knife assembly according to the invention, the changing of the reversible knife is particularly rapid and easy. In addition, the reversible ~~knives~~ knives can be sharpened many times. Despite sharpening, the cutting bevel edge of the reversible knife can be securely and rapidly set at the desired location. This is achieved through the surprising joint operation of the reversible knife and the counter knife, without separate keys. In addition, the attachment of the counter knife is more secure than before and the counter knife is easier to change. Further, the clamp is supported in the frame in a new way, permitting a higher loading than previously to be imposed on the entire knife assembly. In addition, the support of the clamp and the knife assembly facilitates the correct assembly of the knife assembly and the elimination of loose fits. In addition to this, the reversible knife can be changed by slightly slackening the clamp. Similarly, the

reversible knife can be changed without tools. In addition, the knife assembly forms a compact totality and firmly supports the reversible knife.

Replace the paragraph beginning on page 4, line 11 with the following amended paragraph:

Figure 1 shows the knife frame 11 of a drum chipper that is as such conventional, to which three knife assemblies 12 according to the invention are fitted. The knife frame 11 rotates in the direction shown by the arrow and is supported by other structures, which are not shown here. The same reference numbers are used for components that are operationally similar. In addition, in front of each knife assembly 12 in the direction of rotation, a sawdust pocket 13 is arranged, with space for the chips detached by the knife assembly 12. The knife assembly according to the invention suits all types of chipper, both fixed and mobile. Figures 2a and 2b show the knife frame 11 of a so-called disc chipper, in which the knife assembly 12 is attached to the frontal surface of the knife frame 11. The chips then exit through an opening in the knife frame 11. In addition, the knife assembly according to the invention can also be used in log cant chippers used in sawmills, in which the reversible ~~knives~~ knives are attached to a conical knife frame. In the plank trimming chippers also used in sawmills, the knife assemblies are often set at an angle to the axis of rotation of the knife frame. The diameter of the knife frames described is about 350 mm. By altering the dimensioning, the knife assembly according to the invention can also be used in routers, even down to handtool-size.

Replace the paragraph beginning on page 5, line 31 with the following amended paragraph:

In the knife assembly according to the invention, the aforesaid reversible knife, counter knife, and locking piece are arranged in such a way that the position of the reversible knife relative to the knife frame can be set as desired in the lateral direction of the reversible knife. In other words, the reversible knife can be set in different positions in

the knife assembly. The feature in question is explained later in detail. The locking piece according to the invention is generally arranged as a fixed part of the reversible knife or of the counter knife. In addition, shape-locking is surprisingly used to fit the counter knife to the knife frame. In other words, the counter knife is secured without the known screws. The counter knife can thus be changed rapidly without tools and without removing the clamp. In addition, conventional reversible ~~knives~~ knives can be used.

Replace the paragraph beginning on page 7, line 28 with the following amended paragraph:

The reversible ~~knives~~ knives according to the invention are also sharpened. A single reversible knife can then be used for a considerably longer time than a conventional knife, which is advantageous in terms of total cost. The movement of the cutting bevel edge that occurs when the reversible knife is sharpened is compensated for using a counter-knife series according to the invention. Both cutting bevel edges of the reversible knife are thus arranged to be resharpenable. For this purpose, the knife series includes a corresponding counter knife for each sharpened reversible knife. Thus, the position of the sharpened cutting bevel edge can be altered to remain the same, relative to the knife frame, as it was prior to sharpening. Similarly, a wide locking piece can be used, when it is part of the changeable counter knife. Figures 4a-d show one series of counter ~~knives~~ knives for the knife assembly. Figures 4f-j show a second series of counter ~~knives~~ knives. The counter ~~knives~~ knives are mutually similar in other respects, except that the position of the protruding locking piece varies in the lateral direction of the reversible knife. This compensates for the movement of the cutting bevel edge caused by sharpening. It is then possible to sharpen a single reversible knife according to the example four times and in practice even more, depending mainly on the sharpening and the reversible knife. For example, in each sharpening, $[[0,5]]$ 0.5 mm of material is removed from each cutting bevel edge, so that in four sharpenings the reversible knife will narrow by 4 mm. In practice, the counter knife and the locking piece are dimensioned according to each type of

reversible knife and sharpening method. Generally, the series of counter ~~knives~~ knives includes 1 - 6, preferably 2 - 5 different counter ~~knives~~ knives. Thus, the position of the reversible knife changes by $[[0,5]]$ 0.5 - $[[1,5]]$ 1.5 mm, preferably $[[0,8]]$ 0.8 - $[[1,2]]$ 1.2 mm, its lateral direction, after each sharpening. The worn cutting bevel edge and the sharpening tolerance (broken line) are shown in Figures 4b, 4d, 4g, and 4i. The movement of the locking piece appears most clearly in Figures 4f - j, in Figures 4f and 4g of which the counter knife is the same when the reversible knife is reversed. Figures 4h and 4i show a second counter knife of the counter-knife series while Figure 4j shows a third counter knife.

Replace the paragraph beginning on page 8, line 32 with the following amended paragraph:

The use of a changeable counter knife also brings other advantages. The counter-knife series according to the invention includes at least one second counter-knife series containing a corresponding number of counter ~~knives~~ knives. In the second counter-knife series, the angle γ of the counter bevel edge and/or its distance from the cutting bevel edge is different to that of the first counter-knife series. This allows the shape and length of the chip to be altered by changing the counter knife. In other words, the operation of the chipper can be adjusted to suit each material being chipped and the operating conditions. For example, different knife settings are used for softwoods in winter and in summer. Correspondingly, there are different settings for hardwoods and softwoods. The angle γ and the counter bevel edge are shown in Figure 3b.

Replace the paragraph beginning on page 9, line 11 with the following amended paragraph:

The wedge-like construction of the counter knife and the clamp means that both the reversible knife and the counter knife can be easily changed by loosening the screws. In addition, the reversible knife can be easily put back into the knife assembly, thanks to the

broad and fixed locking piece. As is known, the reversible knife wears in use. The clamp and the counter ~~knives~~ knives, on the other hand, will last for a very long time. Thus the same clamp and counter-knife series can be used for a long time in the same position with the same kind of reversible ~~knives~~ knives. The clamp and counter knife are preferably precipitation-hardened cast or rolled pieces, allowing durable and dimensionally precise pieces to be obtained in one operation. The relatively small counter knife 16 shown in Figure 3b is easily and economically made by casting. Correspondingly, the larger counter knife 16 shown in Figure 3a has a simple shape, so that it can be successfully manufactured by rolling. The transmission of force to the knife frame can be assisted by arranging the locking piece to be shape-locked to the counter knife (Figure 3a). The force tending to open the reversible knife is then partly transmitted through the counter knife to the knife frame, thus reducing the load on the clamp. At the same time, the reversible knife is prevented from detaching from the counter knife. In Figure 3a, the shape-locking is implemented using a dovetail joint.

Replace the paragraph beginning on page 10, line 1 with the following amended paragraph:

The use of the knife assembly according to the invention saves materials costs, as the reversible ~~knives~~ knives can be sharpened many times. The considerable shortening of installation time due to easier knife changing is also important. Further, the characteristics of the knife assembly can be easily adjusted and the knife assembly can be applied to the attachment of many different kinds of reversible knife.